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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/573,467

04/13/2007

Hiroya Kobayashi

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55694 7590 12/09/2008  
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EXAMINER

PATTON, PAUL E

ART UNIT

PAPER NUMBER

2822

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12/09/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/573,467	<b>Applicant(s)</b> KOBAYASHI ET AL.	
	<b>Examiner</b> PAUL E. PATTON	<b>Art Unit</b> 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/08/08, 9/19/08, 10/07/08</u>                                | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed September 19, 2008 have been fully considered but they are not persuasive. In particular applicant argues that neither Higashi nor Saito disclose a thinned portion. However, it is evident that the thinned portion is clearly disclosed by the primary reference to Muramatsu (US 2002.0020859), who discloses a virtually identical device to that of the applicant differing only in the details of the resin application and the gap. Higashi provides the teaching of the pre-formed resin sheet and Saito teaches allowing a gap in the material to allow ingress or egress of material. The role of the secondary references is to establish that these techniques of device attachment are, indeed, well known in the art and therefore obvious to one of ordinary skill in the relevant technology. The reference to the thinned portion is clearly to that of Muramatsu. Further changing the term of a gap to a communication portion does not materially alter the meaning of the claim nor alter the basis of rejection.

2. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., avoiding cracking of the thinned portion, and distortion due to trapped air) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

***Claim Rejections - 35 USC § 103***

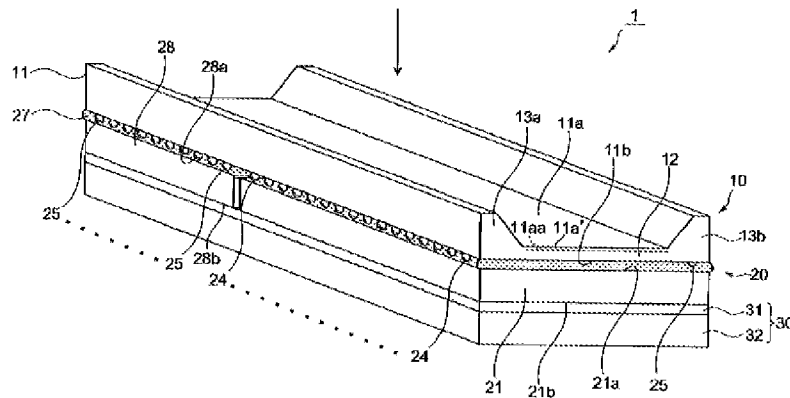
3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

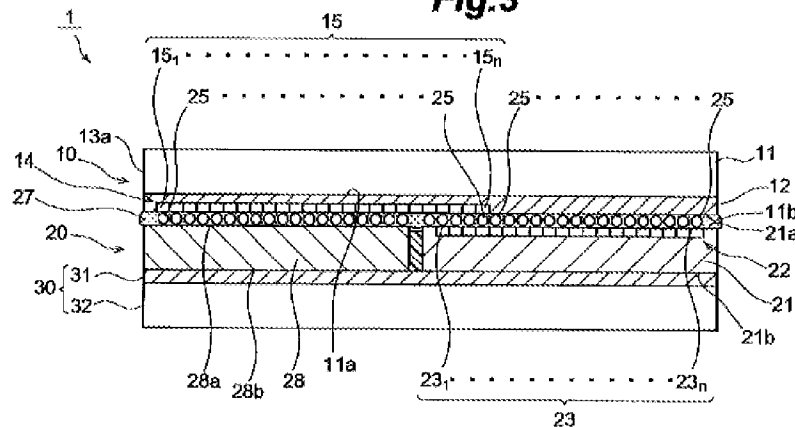
4. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muramatsu (US 2002/00220859 A1) in view of Higashi et al., (USPAT 5,918,113) hereinafter Higashi and further in view of Saito (JP2003-124259).

5. As to claims 1 and 3, Muramatsu discloses and shows (Figs 1 & 3) a semiconductor 13b having a photodetecting unit (11) formed on one surface, a thinned portion formed by etching a region, opposing a photodetecting unit, of another surface, an outer edge surrounding the thinned portion, and first electrodes disposed on the one surface the outer edge and electrically connected to the photodetecting unit; a wiring substrate (21) disposed to oppose the one surface side of the semiconductor substrate and having second electrodes (23) connected via conductive bumps (25) to the first electrodes; and a resin (27), filling a gap between the wiring substrate and the outer edge with the conductive. bumps.

**Fig. 1**



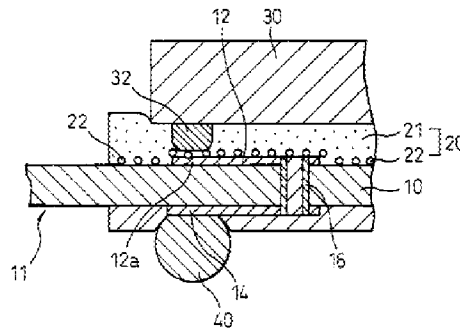
**Fig.3**



6. Muramatsu does not disclose or show that the resin is a resin sheet, adhering the sheet to a predetermined region on the other surface of the substrate and thermo-compression bonding the semiconductor substrate with the resin sheet to the wiring substrate.

7. Higashi discloses and shows (Higashi, Fig 1) the resin is a resin sheet, adhering the sheet to a predetermined region on the other surface of the substrate and thermo-compression bonding the semiconductor substrate with the resin sheet to the wiring substrate. (Column 3, line 37 – column4, line 43, see also the entire patent).

Fig. 1



8. Higashi is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to use a resin sheet, adhering the sheet to a predetermined region on the other surface of the substrate and thermo-compression bonding the semiconductor substrate with the resin sheet to the wiring substrate.

9. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Muramatsu by using a resin sheet, adhering the sheet to a predetermined region on the other surface of the substrate and thermo-compression bonding the semiconductor substrate with the resin sheet to the wiring substrate for advantages such as simplifying the assembly process with improved production efficiency according to the teachings of Higashi (Column 1, lines 49-53).

10. Muramatsu as modified by Higashi does not disclose that the resin sheet surrounds the periphery of the gap between the wiring substrate and the outer edge of the thinned portion of the device except for portion of the periphery.

11. Saito, discloses and shows (Fig 4) a resin sheet (30) with a communicating portion formed so as to laterally penetrate through the resin sheet.

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12. Saito is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to use a resin sheet with a communicating portion formed so as to laterally penetrate through the resin sheet.

13. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Muramatsu as modified by Higashi by using a resin sheet with a communicating portion formed so as to laterally penetrate through the resin sheet. for advantages such as permitting the ingress or egress of materials filling the gap according to the teachings of Saito..

14. As to claim 2, Muramatsu discloses the photodetecting unit has a plurality of pixels (15) that are arrayed one-dimensionally or two-dimensionally.

### ***Conclusion***

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL E. PATTON whose telephone number is (571)272-9762. The examiner can normally be reached on 7:00 - 5:30 Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Zandra V. Smith/  
Supervisory Patent Examiner, Art Unit 2822

Paul E Patton  
Examiner  
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